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PSC

MANITOWOC PUBLIC UTILITIES

1303 South 8th Street P.O. Box 1090 Manitowoc, WI 54221-1090 920-683-4600 FAX 920-686-4348 www.mpu.org

January 21, 2003

Mr. Scot Cullen, Chief Electric Engineer
Public Service Commission
610 N. Whitney Way
P.O. Box 7854
Madison, WI 53707-7854

RE: In the Matter of Filing Reporting Requirements for Appropriate Inspection and Maintenance, PSC Rule 113.0607(6)

Dear Mr. Cullen:

Enclosed for filing are 3 copies of Manitowoc Public Utilities' report to the commission, submitted every two years, showing compliance with its Preventative Maintenance Plan.

Very truly yours,

Philip B. Platteter

Philip B. Platteter
Electrical Engineer

Enclosures

TWO YEAR REPORT DOCUMENTING COMPLIANCE WITH THE PREVENTATIVE MAINTENANCE PLAN

Manitowoc Public Utilities

FILING DEADLINE
FEBRUARY 1, 2003

January 21, 2003

Philip Platteter
1303 South 8th Street
Manitowoc, WI 54221-1090
(920) 686-4352
pplatteter@mpu.org

RECEIVED
JAN 27 2003
Electric Division

This report format was prepared by the MEUW work group for PSC Rule 113.0607 for use by the 82 municipal electric utilities in Wisconsin and endorsed by PSC staff as meeting the requirements of Rule PSC 113.0607.

I Reporting Requirements: PSC 113.0607(6) states;

Each utility shall provide a periodic report to the commission showing compliance with its Preventative Maintenance Plan. The report shall include a list of inspected circuits and facilities, the condition of facilities according to established rating criteria, schedules established and success at meeting the established schedules.

II Inspection Schedule and Methods:

SCHEDULE:	MONTHLY	ANNUAL	EVERY 5 YEARS
Transmission (≥69Kv)		X	X
Substations	X	X	
Distribution (OH & UG)			X

METHODS: Five criteria groups will be used to complete the inspection of all facilities.

1. IR – infrared thermography used to find poor electrical connections and/or oil flow problems in equipment.
2. RFI - Radio Frequency Interference, a byproduct of loose hardware and connections, is checked using an AM radio receiver.
3. SI – structural integrity of all supporting hardware including poles, crossarms, insulators, structures, bases, foundations, buildings, etc.
4. Clearance – refers to proper spacing of conductors from other objects, trees and conductors.
5. EC – equipment condition on non-structural components such as circuit breakers, transformers, regulators, reclosers, relays, batteries, capacitors, etc.

Distribution facilities will be inspected by substation circuits on a 5-year cycle such that the entire system will be inspected every 5 years. Inspector instructions for inspecting all facilities and forms are included in the plan.

III Condition Rating Criteria

This criterion, as listed below, establishes the condition of a facility and also determines the repair schedule to correct deficiencies.

0) Good condition
1) Good condition but aging
2) Non-critical maintenance required – normally repair within 12 months
3) Priority maintenance required – normally repair within 90 days
4) Urgent maintenance required – report immediately to the utility and repair normally within 1 week

IV Corrective Action Schedule

The rating criteria as listed above determine the corrective action schedule.

V Record Keeping

All inspection forms and records will be retained for a minimum of 10 years. The inspection form contains all of the required critical information i.e. inspection dates, condition rating, schedule for repair and date of repair completion.

VI Reporting Requirements

A report and summary of this plan's progress will be submitted every two years with the first report due to the Commission by February 1, 2003. The report will consist of a cover letter documenting the percent of inspections achieved compared to the schedule and the percent of maintenance achieved within the scheduled time allowance.

VII Inspected Circuits and Facilities

The list of circuits and facilities inspected in the 2001-2002 reporting period are as follows:

Circuit # and description	Substation
C134 13.2kV	Custer
C135 13.2kV	Custer
C136 13.2kV	Custer
D134 13.2kV	Dewey
D135 13.2kV	Dewey
D136 13.2kV	Dewey
R131 13.2kV	Revere
R132 13.2kV	Revere
R133 13.2kV	Revere
R136 13.2kV	Revere
A 13.2kV	Power Plant
AA 13.2kV	Power Plant
B 13.2kV	Power Plant
BB 13.2kV	Power Plant
C 13.2kV	Power Plant
CC 13.2kV	Power Plant
1 4kV	Power Plant
2 4kV	Power Plant
3 4kV	Power Plant
4 4kV	Power Plant
5 4kV	Power Plant
7 4 kV	Power Plant
8 4 kV	Power Plant
9 4kV	Power Plant

1A 4kV	Substation A
2A 4kV	Substation A
3A 4kV	Substation A
4A 4kV	Substation A
5A 4kV	Substation A

The circuits above were inspected on an annual city quadrant basis within the Manitowoc Public Utilities (MPU) territory. The southwest (SW) quadrant (west of South 21st Street and south of the Manitowoc River) was completed in 2001. The southeast (SE) quadrant (from Lake Michigan west, to and including South 21st Street between the Manitowoc River and the south end of the city limits) was completed in 2002. These quadrant maintenance and inspection schedules included a detailed inspection of pole condition, pole treatment, tree trimming, equipment, signage, etc – per the Plan. URD and IR inspections were completed in 2001.

Several inspections above and beyond the scope of the Plan were completed. All vaults were inspected - citywide. Additionally, all MPU 13.2kV circuits were visually inspected in 2001 and 2002 to verify integrity and switching points.

Base load and peaking generation, less than 50 megawatts per unit in size, is typically subject to pre-operational checks, in addition to checks and maintenance during and after periods of operation. See appendices A and B for operations/reliability data.

VIII Scheduling Goals Established and Success of Meeting the Criteria:

It was MPU's goal to complete all monthly substation inspections, annual transmission line inspections as a subcontractor to the American Transmission Company (ATC), and to inspect 50% of the distribution system (SW and SE quadrants). In addition, MPU expected to complete all scheduled maintenance resulting from inspections within the prescribed time periods specified in the rating criteria.

The majority of the inspection goals were met or exceeded. Overall, approximately 50% of the distribution system was inspected, even though no URD inspections took place in 2002 (Manitowoc has predominantly OVH distribution). IR inspections for 2002 were postponed to 2003.

Substation maintenance goals were met. Seventeen priority and non-critical maintenance items were found, with 16 of them being repaired on time. Substation "A" has a non-critical maintenance item that will not be repaired, as all 4kV distribution is in the process of conversion to 13.2kV distribution. Oil and DGA analysis was 100% complete for 2001 and 61% complete for 2002, the balance is in progress. Control house battery maintenance was 100% complete. IR testing was performed in 2001, but not in 2002. RFI Checks were performed on an "as needed" basis. Appendix C provides inspection status at a glance.

IX Facility condition – rating criteria:

During the past two years, 50% of the distribution system was inspected in detail. Substation inspections were completed on time, with few noted exceptions. Of the items found requiring maintenance, all were repaired before they were responsible for outages to customers.

Based upon the rating criteria established in the Plan, circuits and facilities relating to the Custer, Dewey, and Revere substations, along with the circuits and facilities relating to the Power Plant receive a rating of "0" (Good). Circuits and facilities relating to Substation A receive a rating of "1" (Good, but aging).

MPU experienced substantial personnel turnover and vacancies from February to August of 2002 --- Engineering Manager, Engineer, Engineering Technician and the Purchasing/Safety Department. It is recognized that some maintenance activities were deferred from 2002 to 2003, including IR, DGA, and annual quadrant URD inspections. MPU is committed to completion of the maintenance program with new team members in place.

Appendix A
Manitowoc Public Utilities
Generating Unit Performance
2001

Unit #	Net Dependable Capacity (MWH/YR)	Capacity Factor	Forced Outage Rate	Scheduled Outage Rate	Primary Fuel	Production Technology Type
1 Diesel	43,800	3.37%	< 3%	1 to 2 Weeks Per Year	Gas	Internal Combustion Engine
2 Diesel	43,800	2.27%	< 3%	1 to 2 Weeks Per Year	Gas	Internal Combustion Engine
2	43,800	0.00%	< 3%	Based On Operating Hrs. (Emergency Unit)	Coal	Steam Turbine
3	87,600	7.72%	< 3%	Based On Operating Hrs. (Peaking Unit)	Coal	Steam Turbine
4	87,600	62.85%	< 3%	6 to 8 Weeks Every 5 Yrs. Plus 4 Days/ Yr	Coal	Steam Turbine
5	192,720	39.65%	< 3%	6 to 8 Weeks Every 5 Yrs. Plus 4 Days/ Yr	Coal/ Pet Coke	Steam Turbine
6	262,800	56.26%	< 3%	6 to 8 Weeks Every 5 Yrs. Plus 4 Days/ Yr	Coal/ Pet Coke	Steam Turbine
Combustion Turbine	192,720	0.65%	<3%	1 to 2 Weeks Per Year	Gas	Combustion Gas Turbine

Source: Dale Koch,
Superintendent Of Operations And Power Supply
1/14/2003

Appendix B
Manitowoc Public Utilities
Generating Unit Performance
2002

Unit #	Net Dependable Capacity (MWH/YR)	Capacity Factor	Forced Outage Rate	Scheduled Outage Rate	Primary Fuel	Production Technology Type
1 Diesel	43,800	3.85%	< 3%	1 to 2 Weeks Per Year	Gas	Internal Combustion Engine
2 Diesel	43,800	2.98%	< 3%	1 to 2 Weeks Per Year	Gas	Internal Combustion Engine
2	43,800	0.00%	< 3%	Based On Operating Hrs. (Emergency Unit)	Coal	Steam Turbine
3	87,600	4.08%	< 3%	Based On Operating Hrs. (Peaking Unit)	Coal	Steam Turbine
4	87,600	66.47%	< 3%	6 to 8 Weeks Every 5 Yrs. Plus 4 Days/ Yr	Coal	Steam Turbine
5	192,720	53.03%	< 3%	6 to 8 Weeks Every 5 Yrs. Plus 4 Days/ Yr	Coal/ Pet Coke	Steam Turbine
6	262,800	58.17%	< 3%	6 to 8 Weeks Every 5 Yrs. Plus 4 Days/ Yr	Coal/ Pet Coke	Steam Turbine
Combustion Turbine	192,720	0.19%	<3%	1 to 2 Weeks Per Year	Gas	Combustion Gas Turbine

Source: Dale Koch,
Superintendent Of Operations And Power Supply
1/14/2003

Appendix C
Manitowoc Public Utilities
PSC Inspection
vs.
Year

Inspection	Year 2001	Year 2002	Year 2003
Detailed Annual City Quadrant OVH	SW Quadrant-Done	SE Quadrant-Done	NE Quadrant
Annual City Quadrant OVH IR	Done	Defer to 2003	NE Quadrant + SE Quad. (2002)
Monthly Substation	Done	Done	Scheduled
Annual Substation IR	Done	Defer to 2003	2003 + 2002
Annual City Quadrant RFI	On Demand Only	On Demand Only	On Demand Only
Annual City Quadrant URD	Done	Defer to 2003	NE Quadrant + SE Quad. (2002)
Substation DGA	Done	61% Complete Balance in Progress	2003 + Balance from 2002
Substation Battery Maintenance	Done	Done	2003